

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of

Establishment of an Advisory
Committee to Negotiate Proposed
Regulations for Low-Earth Orbit
Satellite Services Operating
Below 1 GHz

CC Docket No. 92-76

Jointly Filed Supplemental
Comments of ORBCOMM, STARSYS and VITA

Orbital Communications Corporation ("ORBCOMM"), STARSYS Global Positioning, Inc. ("STARSYS") and Volunteers in Technical Assistance, Inc. ("VITA"), the applicants for the proposed Non-Voice Non-Geostationary Satellite Services operating in low-Earth orbit (collectively the "Applicants"), have continued their discussions concerning their ability to coexist in the spectrum the Commission proposed to allocate to these services.^{1/} The ability to develop a sharing program has been complicated by the need to accommodate the known and unknown current users of this band, which include a large number of licensees (some of which operate with high power). It has been difficult to design a sharing plan among the three Applicants that will allow them to

^{1/} See Jointly Filed Comments of the Applicants, May 18, 1992 at p. 5.

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operate in this environment, so that some measure of flexibility among the Applicants has necessarily been retained.

The Applicants believe that all three systems can be accommodated within the 137-138 MHz, 148-149.9 MHz and 400.15-401 MHz bands, based on the technical information exchanged among the Applicants and their current understanding of the conditions under which they will be operating.^{2/} The Applicants also believe that they will be able to make highly efficient use of all of the spectrum proposed to be allocated by the Commission for these services.

With these Supplemental Comments, the Applicants have formulated a proposal that is intended to resolve the mutual exclusivity that may exist between ORBCOMM and STARSYS, and to enable the Commission to license the Applicants expeditiously, without a formal hearing. The Applicants have no intention to exclude additional entrants from these bands, and note in this regard that their May 18, 1992 Proposed Service Rules for the Non-Voice Non-Geostationary Satellite Services specifically contemplate further entry.

Additional potential spectrum for these services in the 149.9-150.05 MHz and 399.9-400.05 MHz bands was identified by the

^{2/} To the extent that subsequent, actual operating conditions differ from the Applicants' expectations, the Applicants are committed to engaging in good faith negotiations to develop a proposal for an alternative sharing arrangement that will satisfy the needs of all of the licensees. In addition, the frequencies selected from within the bands have been based on preliminary informal discussions with the U.S. government. There may thus be a need for some adjustments depending on the final coordination with the U.S. government.

Commission in the Notice of Proposed Rulemaking in Docket No. ET 91-280,^{3/} but the availability of that spectrum is unclear. Thus, the Applicants' sharing proposals have not utilized those bands, although the Applicants stand prepared to make productive use of that spectrum, and continue to urge the Commission to allocate that spectrum to the Non-Voice Non-Geostationary Satellite Service. An allocation of the 149.9-150.05 MHz band in particular is consistent with the 1992 WARC, and would well serve the public interest by assuring the highest level of availability for the Non-Voice Non-Geostationary Satellite Service.

The Applicants have proposed to share the 137-138 MHz, 148-149.9 MHz and 400.15-401 MHz bands as follows:

148-149.9 MHz

ORBCOMM would be licensed to operate over the entire bandwidth, employing Dynamic Channel Activity Assignment System (DCAAS) frequency division multiple access (FDMA) modulation techniques, for uplink operations. ORBCOMM initially would confine its operations to the portion of the band above 148.905 MHz (the "upper" part of the band) in order to obviate potential interference to the STARSYS operations in this band. ORBCOMM would use the upper part of the band for its DCAAS operation and for its 50 kHz earth station uplink.

3/ Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and to the Mobile-Satellite Service for Low-Earth Orbit Satellites, ET Docket No. 91-280, FCC 91-305, released October 18, 1991.

STARSYS would also be licensed to operate over the entire bandwidth. It would initially use separate 50 kHz and 855 kHz segments of the band between 148 MHz and 148.905 MHz (the "lower" part of the band), with the 855 kHz segment to be used for user terminal uplinks to the STARSYS satellites, and the 50 kHz segment to be used for STARSYS earth station uplinks to the STARSYS satellites. STARSYS transmissions from user terminals will employ code division multiple access (CDMA) modulation techniques. STARSYS transmissions from its earth stations will employ FDMA modulation techniques.

VITA would use 90 kHz in the band for its FDMA uplink transmissions. VITA's 90 kHz segment would be in the upper part of the band, separate from STARSYS' operations, and separate from ORBCOMM's 50 kHz earth station uplink. ORBCOMM's uplink operations will avoid interference with VITA's system in this band by detecting and avoiding VITA's uplink transmissions.

It is not clear that usage of this band by current and future fixed and mobile radio licensees will allow successful operation of the ORBCOMM DCAAS and STARSYS CDMA systems under the previously described initial sharing arrangement. Recognizing this uncertainty, ORBCOMM and STARSYS may share use of the lower and upper parts of the band, respectively, with the other system, depending upon operational experience. If ORBCOMM traffic saturates^{4/} the upper part of the band, and if actual operating

^{4/} For these purposes, "saturation" is defined as a documented lack of usable spectrum preventing the affected system from utilizing in-orbit resources to provide a commercially acceptable grade of service in the average weekday busy hour.

conditions are such that ORBCOMM's DCAAS system can make use of additional channels in the lower part of the band without causing harmful interference to STARSYS and VITA, then ORBCOMM will also operate in the lower part of the band subject to conditions to be negotiated with STARSYS and VITA.^{5/} If STARSYS traffic saturates^{6/} the lower part of the band, and if actual operating conditions are such that STARSYS' CDMA system can make use of additional spectrum in the upper part of the band without causing harmful interference to ORBCOMM and VITA, then STARSYS will also operate in the upper part of the band subject to conditions to be negotiated with ORBCOMM and VITA.^{7/}

137-138 MHz

Both ORBCOMM and STARSYS would use the 137-138 MHz band for their respective FDMA and CDMA downlink operations. ORBCOMM would use 50 kHz of the band for earth station downlink operations and 270 kHz for satellite-to-user terminal FDMA links.^{8/} STARSYS would use 855 kHz of the band for its

^{5/} For example, the operations of one system will not increase the total radio frequency power at the satellite receivers of the other system by a mutually agreed amount, up to 5%; the particular percentage or other limitations selected will depend on measured busy-hour operating conditions.

^{6/} See n. 4, supra.

^{7/} See n. 5, supra.

^{8/} While not addressed in this intraservice sharing agreement, ORBCOMM additionally has proposed to make use of the previously allocated standard frequency and time signal at 400.1 MHz \pm 25 kHz.

satellite-to-STARSYS earth station CDMA downlink transmission. VITA would not use the 137-138 MHz band.

ORBCOMM and STARSYS will share the same downlink frequency band using a combination of angular separation of the satellites, cross polarization, and power flux density limitations. On occasion, a STARSYS or ORBCOMM satellite may create interference into the other system's earth station when the two satellites are close together. Also, the properties of cross polarization of the respective signals may not provide total protection when one of the satellites is close to the horizon due to the antenna pattern phenomenon of appearing elliptical to the respective antennas, but both STARSYS and ORBCOMM are aware of these occasional conflicts and expect them to have only a minor impact on effective operations for either system.

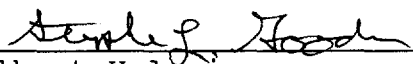
400.15-401 MHz

STARSYS would use 50 kHz of spectrum for FDMA downlink operations from the STARSYS satellites to the STARSYS user terminals. VITA would use 100 kHz of spectrum, separate from STARSYS' operations, for its FDMA downlink transmissions. Specific frequency assignments will be coordinated with appropriate U.S. government agencies.

CONCLUSION

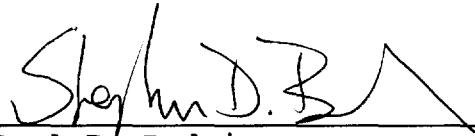
The Applicants believe that the Commission's decision to utilize the alternative resolution mechanism of a Negotiated Rulemaking with a relatively short deadline represents a positive and important step in the direction of streamlining government processes so as to expedite the introduction of important new technologies and services. With this demonstration of a capability for intraservice sharing, the Applicants believe that the Negotiated Rulemaking proceeding can be concluded quickly. Therefore, the Applicants urge the Commission, promptly following the Negotiated Rulemaking, to complete the regulatory actions necessary to inaugurate Non-Voice Non-Geostationary Satellite Services operating below 1 GHz, including release of a notice of proposed rulemaking containing the previously submitted licensing and service rules, adoption of a final allocation order (including the proposed 149.9-150.05 MHz and 399-400.05 MHz bands), and conduct of parallel processing of the applications. These are the necessary and appropriate steps to further the public interest and the Commission's goal of expeditiously making available these important new services to the public.

Respectfully submitted,



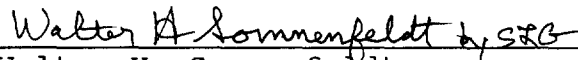
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CERTIFICATE OF SERVICE

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